

THE OPERATIVE TECHNIQUE OF APPENDICITIS.¹

By GEORGE RYERSON FOWLER, M.D.,

OF BROOKLYN.

SURGEON TO THE METHODIST EPISCOPAL AND TO ST. MARY'S HOSPITAL.

IN THE class of cases in Dr. Stimson's first group the question is simply one of explorative laparotomy. We here enter upon a much broader field of study than the limits of this discussion will permit. As he truly observes, in the absence of all previous knowledge of the conditions present, with only the general symptoms of appendicitis and the possible addition thereto of right iliac pain, and the point tenderness of McBurney, the surgeon must be prepared to encounter almost all conceivable conditions, from a simply inflamed appendix all through the different grades of the disease, such as sloughing, ulceration, perforation, the formation of extensive or slight adhesions, and pus accumulations in unusual places. The only formal portion of the operation here consists in the planning of the incision in such a manner as to most easily reach the base of attachment of the appendix itself. But when once the peritoneal cavity has been reached, the rest of the procedure depends upon the experience, judgment and skill of the operator; no definite plan can be formulated for his guidance, but a few hints may be offered for his aid.

In this discussion, the ordinary precautions to be taken by the operator and his assistants need not of necessity be entered into. It is generally conceded, at the present day, that a grave responsibility rests upon the surgeon who increases the risks to which his patient is to be subjected in the operative

¹A discussion of the paper on the same subject by Dr. L. A. Stimson, presented at the New York State Medical Society, February, 1891.

procedure, by a failure to properly protect him from the noxious effects of putrefactive or pathogenic bacteria. There is a point, however, to which I desire to allude, as preliminary proper to the subject of laparotomy for appendicitis, and this relates to the cleansing of the integumentary surface of the abdominal wall before making the incision.

It is a well established fact that by far the great majority of the micro-organisms of which the surgeon of the present day stands in so much dread have their habitat in and about the patient himself. His underclothing, clothing and skin will furnish sufficient sources of infection to account for all the evils which only too often follow in the train of even the simplest or most trivial operation or other wound. I need not refer in detail to the various methods employed to prevent these, but will only call attention to a means which I have employed recently: I have reason to believe that I have observed less "stitch suppuration," which is the most common result of inefficient cleansing of the skin, since its employment than heretofore. The plan consists of simply giving the skin about the field of operation a coating or two of ordinary tincture of iodine a short time prior to making the incision. Whether the operation of incision and drainage on the one hand, or true laparotomy, on the other, is selected, the surgeon is, as a rule, obliged to reach the seat of the difficulty in as short a time as possible, and there is but very limited opportunity, in most instances, of giving the patient's skin that preliminary care represented by shaving, repeated scrubbings, bichloride bathings, soft soap poultices, etc. In this, as in other emergency cases, I have employed the tincture of idodine, after shaving and scrubbing, as an additional means of preventing infection from the skin.

When a skilled assistant is at hand, he is placed directly opposite the operator, the latter standing upon the patient's right. I am in the habit of relying upon this assistant almost exclusively to keep the coils of intestine out of the way, as I proceed in my search for the appendix. I consider this of the greatest importance, as it dispenses with the broad right-angled metal retractors, mentioned by Dr. Stimson. In place of flat sponges, compresses about ten inches square, made of

several layers of sterilized gauze, with their edges hemmed to prevent fraying, are used. These are kept at hand in abundance, placed in a hot sublimate solution. They are placed over the folds of intestine, as the latter come into view, and the assistant's fingers, by careful pressure upon the gauze compresses, keep the field of search clear. In the first steps of the operation, that of the lateral incision along the outer edge of the right rectus muscle, this assistant may sponge and tie vessels; but as soon as the cavity of the abdomen is open, his sole duty should be to take charge of the coils of intestine, keeping them out of the way by using his fingers as retractors, as above described. The sponges employed are made of sterilized gauze likewise. The large gauze compresses take the place entirely of all towels and napkins, thus simplifying very much the preparations for the operation.

When a skilled assistant is not at hand, the retractors are of service; the operator from time to time changes their position, always being careful that their corners and edges are well protected by the gauze compresses, in order to avoid injury to the intestinal surfaces; they must then be entrusted to whatever assistance is at hand.

It is not always easy to avoid the epigastric artery and vein, for if the incision is prolonged well downward, these are almost certain to be divided in the lower angle of the wound.

As soon as the cavity of the peritoneum is opened the operator may be confronted with a number of coils of intestines matted together, or he may find these free and movable upon each other. After carefully parting these, a gauze compress is placed over, and drawn upward over them and toward the median line by the fingers of the assistant. It has been my habit to have the outer edge of the wound well retracted at this stage, and search for evidences of pus toward the outer boundary of the abdominal and pelvic cavity; it is in this direction that the pus, if any is present, in the majority of cases makes its way. If this proves to be the case, all traces of it are carefully wiped away, and the adjacent folds of intestine carefully separated still further, the direction from which the pus flows serving as a guide to its source. Should no pus be present, search for the appendix is continued directly beneath

the line of the incision in the abdominal wall. The fingers of the operator, as suggested by Dr. Stimson, serve best in this search; the adhesions being recent, are usually easily broken down. A gush of pus from any direction is an indication to at once cease the manipulation until this has been wiped away, else this may be forced between the coils into parts from which it will be found impossible to subsequently remove it. Should the cæcum be reached without meeting any evidences of suppuration, the case is a favorable one; for when once the former is identified, the way is comparatively clear to a prompt removal of the appendix. This is to be accomplished in the manner so clearly described by Dr. Stimson.

Care should be exercised in manipulating the appendix after its identification, lest, if it be not already ruptured, this accident occur before the ligature is applied, and the peritoneum be contaminated by faecal matter exuding from the opening. A gauze sponge, placed beneath the point where the section is made, when this is possible, is a wise precaution, in order to prevent soiling of the parts by the escape of the contents of the appendix from its severed extremity.

I have never seared the stump with pure carbolic acid, simply contenting myself with thorough disinfection by means of the acid sublimate solution of La Place.

Should the base of attachment of a gangrenous appendix be involved, it is a wise precaution to place a few Lembert sutures in position on either side of the same, in order to fold the peritoneal coat of the intestine over the point of section, should such be deemed necessary after it has been ligatured. Otherwise simple ligature is to be preferred to the plan of folding in the edges of the stump and suturing them.

The best guide to the location of the appendix, when the colon has been reached without recognizing the former, is without doubt that mentioned by the last speaker. The longitudinal band upon the anterior aspect of the ascending colon, terminating as it does at the point of attachment of the appendix, should always be borne in mind. At all events, in my judgment, search for the appendix should be persisted in until either it is found, or a well marked abscess cavity discovered. In the latter case it is fair to infer that the appen-

dix, probably in an ulcerated or sloughing condition, is involved in the walls of the abscess cavity. This condition, it is scarcely necessary for me to suggest, would be a contra-indication to any further attempt at its removal; any interference with such a state of affairs would only unnecessarily imperil the patient's life without any compensating advantage. Nature will take quite as good care of the appendix, accomplishing its obliteration almost as certainly as can the surgeon, and with much less risk to the patient.

I have never found it necessary to drain in any other than the direction of the wound itself, except in those instances in which the structures behind the peritoneum have been invaded. By isolating the seat of the abscess cavity, or the parts surrounding the points of section, in case of removal, with gauze compresses, and cleansing thoroughly the surroundings, the subsequent use of combined gauze and tube drainage will suffice.

I agree with Dr. Stimson in the matter of flushing the peritoneum, even though some pus may seem to have been diffused in the abdominal cavity. The use of hot water for this purpose has always seemed to me to be a delusion, and the additional advantage claimed for it in the shape of its stimulating effect I have failed to realize. It has been a matter of repeated observation to me that any stimulating effect which may have resulted from its use has been promptly followed by a very marked, and in some instances alarming depression.

In dressing the parts, I prefer to use zinc oxide gauze rather than iodoform, for the reason that the former may be sterilized by heat, is equally efficient as an antiseptic in this region, and will drain quite as readily. It should be packed around a glass drain in such a manner as to keep the folds of intestine from coming into direct contact with the parts that have been infected by pus, when this has been found. The ends of the gauze packing should be led by the nearest route to the abdominal opening. A strip oftauze should likewise be placed in the glass drain itself; the extremity of the latter should rest within the abscess cavity or at the site of the stump. In case no pus has been found and the surrounding parts have been left in a clean state, all drainage may be omitted.

I have a decided objection to permitting the gauze to remain *in situ* longer than is absolutely necessary for the removal of septic material, or of fluids which are liable to undergo putrefactive changes. This objection refers particularly to the tendency which its presence gives rise to in the shape of rapid formation of adventitious tissue and adhesions, which may subsequently become sources of danger to the patient.

The line of incision in Dr. Stimson's second group will depend somewhat upon the case at hand. Where decided induration is present, or a distinct tumor can be made out, it will be following good general technique to place the incision over the most prominent portion presented to us. Willard Parker's incision was placed parallel with Poupart's ligament, and at about the site usually selected for ligature of the external iliac artery. This surgeon's operations were confined to simple incision and drainage of abscesses in this region; for this reason the method usually attributed to him fulfilled all the indications; the addition of a vertical incision along the outer edge of the rectus muscle would be indicated in instances where the mass lies well upward, and is not easily reached by the plan just named.

In cases in which decided tumor is present, the dissection is carried directly to the mass. As the latter is approached some evidences of inflammation will be found, as a rule, in the deeper structures. An oedematous condition of these latter and a tendency to matting together of the parts is almost invariably present, and in my experience, contrary to that of Dr. Stimson, pus is more often found than not, when these signs are present. In fact, in studying my own cases, I have been struck by the fact that the presence of a well-defined tumor of inflammatory origin, without the presence of pus, in this region is a rare occurrence. It is my habit, therefore, to seek at once for the surface of the growth, without attempting to identify both layers of the peritoneum, for the reason that these will be found adherent to each other; in other words, the tumor, with its superjacent peritoneum, will be found attached to the parietal peritoneum. In these cases the operation really consists of the opening of an abscess, and nothing more. I have never been able to identify the appendix in

these cases, and if such identification were possible, it would serve no good purpose; the impossibility of effecting its removal without extensively damaging surrounding structures must be apparent at a glance.

The question of drainage in these cases will be decided on general principles. It may be necessary at times to drain through the loin, the lateral wall, or as has happened in one of my own cases in which the pus had found its way through the crural ring, in the thigh as well. The cases which demand drainage through the loin are those in which the post-peritoneal cellular tissue has become invaded; the addition of free incisions in the lumbar region will likewise here be found necessary in order to prevent general infection.

The length of time which is required for drainage will vary in different cases. In those instances in which the appendix has sloughed away close to the gut, and the latter opened thereby, faecal matter will be found upon the first or second dressing. One need not necessarily be discouraged by this circumstance; I have succeeded, by daily irrigation and gauze packing, even under these unfavorable circumstances, in effecting a closure of the wound and opening into the intestine.

Should the external incision be an extensive one, there is no objection to the application of a few sutures, beginning at the angles and placing them in such a manner as to leave sufficient room for the drainage-tube and gauze packing to emerge. If faecal matter is found at the start, this should be omitted and reliance placed upon gauze packing in the subsequent treatment; experience shows that, if the wound be funnel-shaped and largest without, the granulating process, as it goes on, by closing in the bottom of the cavity first, is far more likely to prevent the occurrence of a faecal fistula as a sequel. If faecal matter is found upon the dressing subsequently, any sutures that have been applied should at once be removed.

There is a class of cases, fortunately rare, in which the general symptoms of appendicitis are present, but in which failure to locate the lesion arises from the presence of an abnormality in the anatomical relations of the appendix itself. Such

a case recently came under my care. The entire absence of both local pain and tenderness, referable to the right iliac region, led me to delay operative interference, although the entire clinical picture, exclusive of these, suggested an appendicitis; rapid perforation and a prompt lethal exit followed. The diagnosis was established post-mortem, as well as the explanation of the absence of the classical symptoms of point pressure and iliac tenderness. The appendix was found lying to the left of the median line, and about an inch above the umbilicus, being fixed in this position by an exceedingly short meso-colon. In a similar case I should not hesitate to make the median abdominal incision as in an ordinary explorative laparotomy, the subsequent course of the operation being guided by the indications found to be present after reaching the abdominal cavity.

With the sole exception of the class of cases last alluded to, I know of no conditions, referable to the appendix vermisformis, for the relief of which any line of incision other than the lateral vertical of Sands or oblique of Willard Parker is at all applicable.